Exam: Function Reflections (EXAM version 605)

1. (worth 9 points) Let function f be defined by the polynomial below:

$$f(x) \;=\; 3x^5 - 9x^4 - 6x^3 - 2x^2 + 4x + 8$$

Draw lines that match each function reflection with its polynomial:

Reflections	Polynomials

$f(-x)$ ●   ● $\quad 3x^5 + 9x^4 - 6x^3 + 2x^2 + 4x - 8$
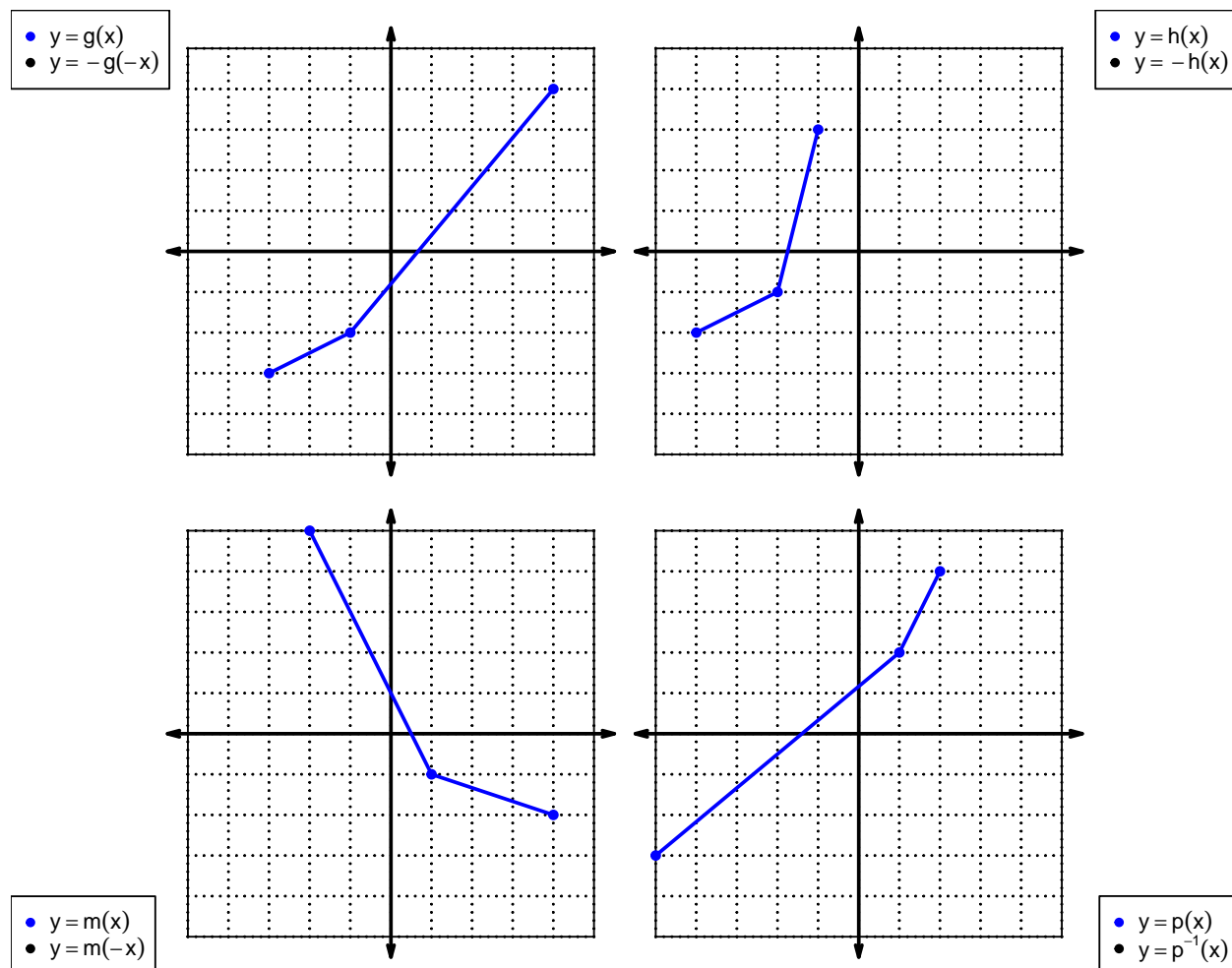
$-f(x)$ ●   ● $\quad -3x^5 + 9x^4 + 6x^3 + 2x^2 - 4x - 8$

$-f(-x)$ ●   ● $\quad -3x^5 - 9x^4 + 6x^3 - 2x^2 - 4x + 8$

2. (worth 20 points) In each xy plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The x axis is horizontal and the y axis is vertical (as typical), and the scale is equal on both axes.

- $y = g(x)$
- $y = -g(-x)$

- $y = h(x)$
- $y = -h(x)$

- $y = m(x)$
- $y = m(-x)$

- $y = p(x)$
- $y = p^{-1}(x)$

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For all questions on this page, the functions f, g, and h are defined by the table below.

x	$f(x)$	$g(x)$	$h(x)$
1	4	7	3
2	2	8	9
3	9	9	4
4	8	1	7
5	1	3	2
6	7	6	1
7	5	2	8
8	3	5	6
9	6	4	5

3. (worth 3 points) Evaluate $f(9)$.

4. (worth 3 points) Evaluate $g^{-1}(2)$.

5. (worth 3 points) Assuming f is an **odd** function, evaluate $f(-4)$.

6. (worth 3 points) Assuming h is an **even** function, evaluate $h(-1)$.

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7. (worth 15 points) A function, f, is **even** if $f(x) = f(-x)$ for all x in the domain. A function, g, is **odd** if $g(x) = -g(-x)$ for all x in the domain.

Let polynomial p be defined with the following equation:

$$p(x) = -x^3 - x$$

a. Express $p(-x)$ as a polynomial in standard form.
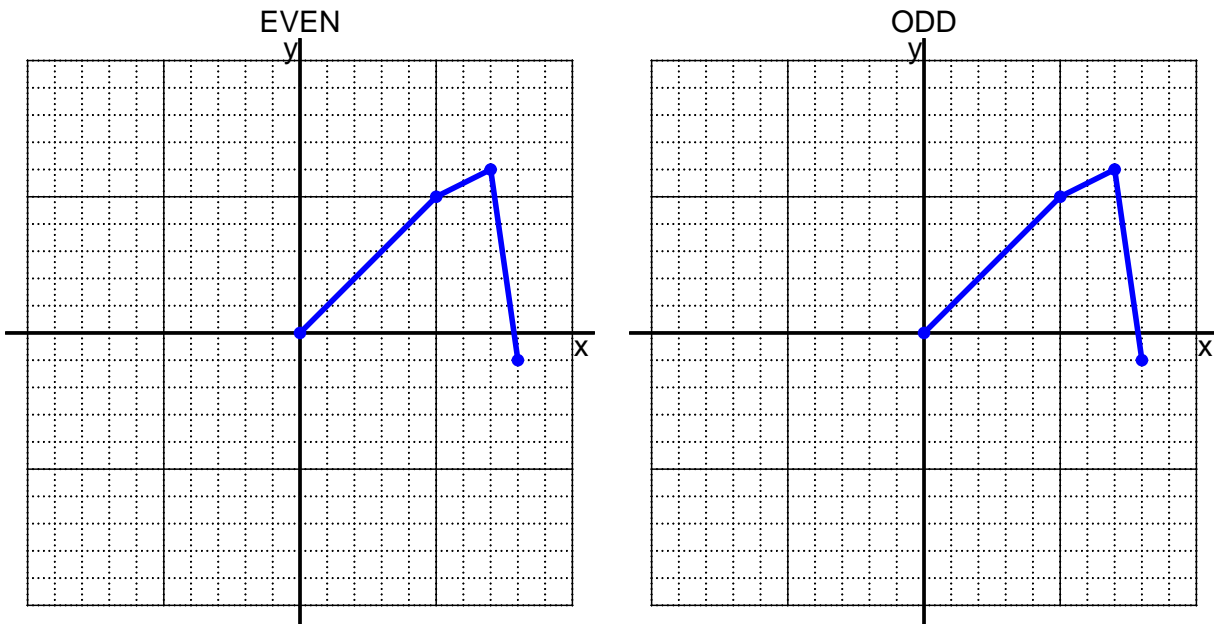
b. Express $-p(-x)$ as a polynomial in standard form.

c. Is polynomial p even, odd, or neither?

d. Explain how you know the answer to part c.

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8. (worth 10 points) I have drawn half of a function. Draw the other half to make it even or odd.

EVEN

ODD

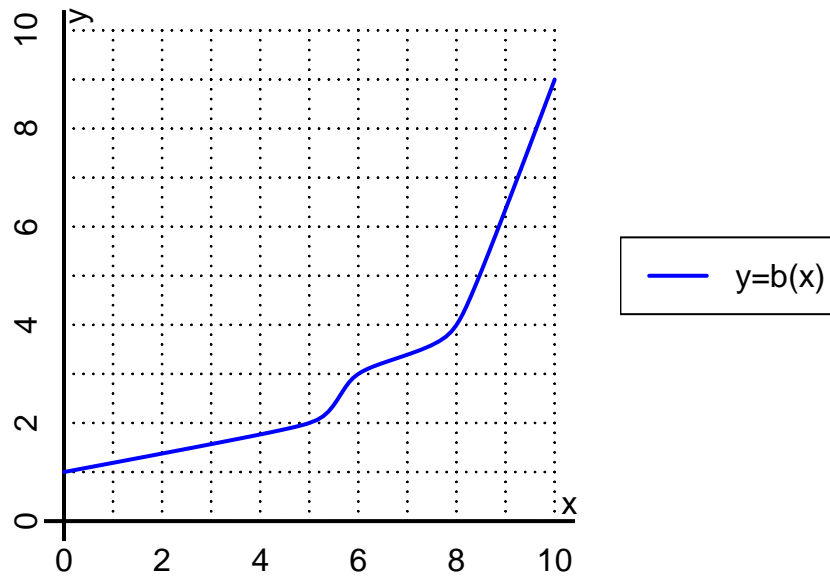9. (worth 10 points) Let function f be defined with the equation below.

$$f(x) = \frac{x+9}{8}$$

a. Evaluate $f(15)$.

b. Evaluate $f^{-1}(2)$.

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10. (worth 6 points) The function b is represented by the curve $y = b(x)$ graphed below.

a. Evaluate $b(6)$.

b. Evaluate $b^{-1}(2)$.

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11. (worth 18 points) Function f is defined by the table below.

    a. Complete the columns for $-f(x)$ and $f(-x)$ and $-f(-x)$.

x	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	3			
-1	-9			
0	0			
1	-9			
2	3			

b. Is function f even, odd, or neither?

c. How do you know the answer to part b?